Detroit Edison Perspective on Michigan Wind Energy Development

January 19, 2009

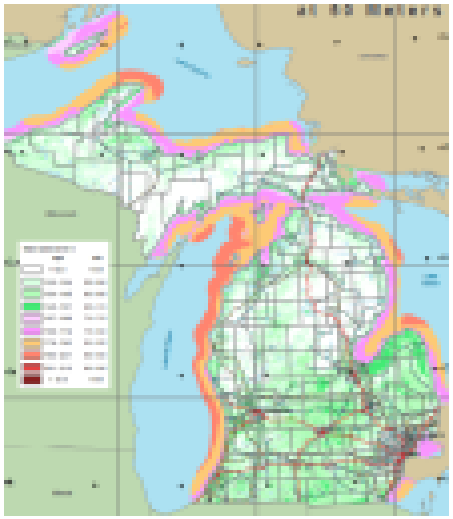
Discussion Points

- Detroit Edison Background
- Progress
- Future Capabilities

Background

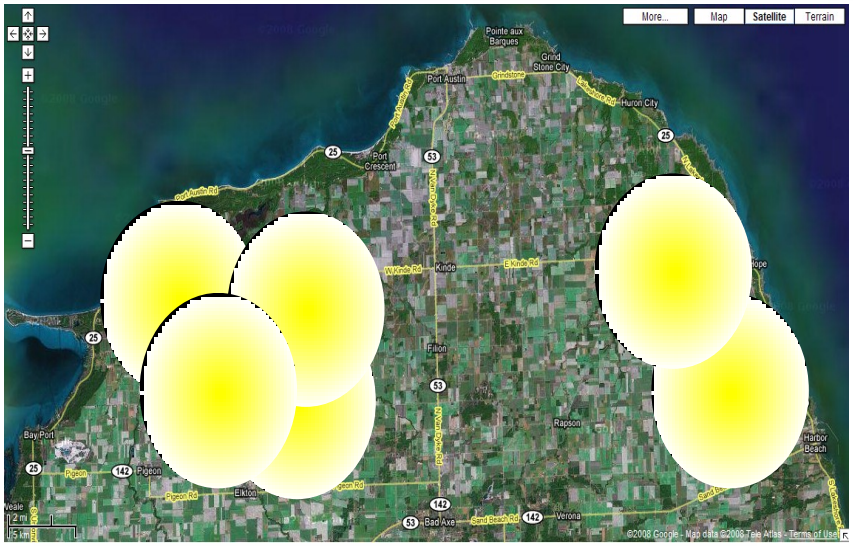
- Capacity Needs Forum (2004)
  - Identified need for new generation prior to 2011
  - 830 MW of wind potential in Michigan with 415 MW developable within the study period
- Conducted siting study for new generation in 2006 (coal, nuclear, combined cycle & wind)
- Once siting was completed, DECO started working on an Integrated Resource Plan
  - What type generation, when and at what cost
  - Wind works well in short to mid term if there is a RPS

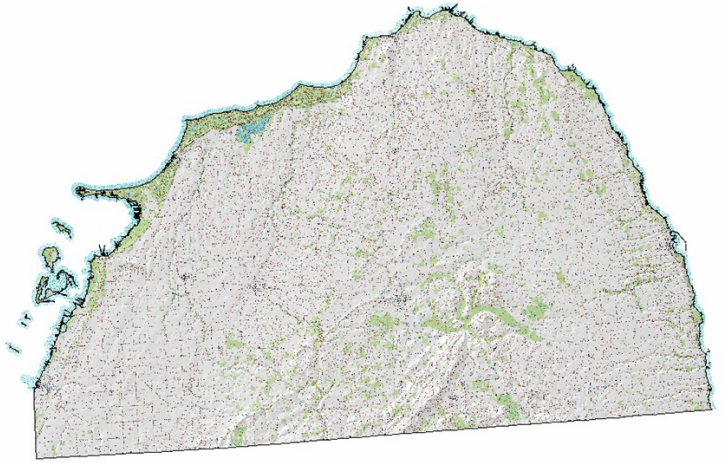
Background (wind siting)



- Using National Renewable Energy Lab wind maps, identified areas in service territory with strong wind resource
- Used velocity maps to evaluate how much infrastructure is in place to deliver wind turbine components
- Performed “fatal flaw analysis” in key areas:
  - Environmental / Wildlife
  - FAA
  - Transmission

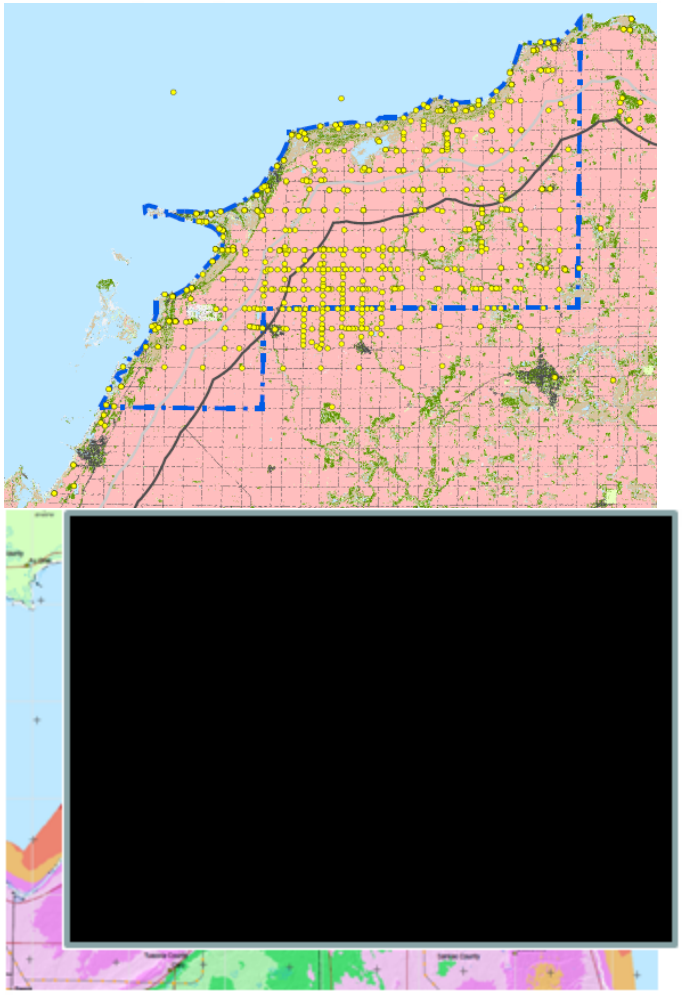
Progress





- Average of 1 year of met data at 6 locations in Huron Co at elevations from 10m to 120m
- Preparing to re-site one met tower at a new location
- Acquired 8% of land rights in Huron Co (approx. 20% of developable area)

Progress (cont'd)



- Avian/bat surveys initiated in 2007 and ongoing
- Medium and high resolution meso maps @ 80m, 90m, & 100m (approx. every sq. mi. in the thumb has been modeled)
- Preliminary geotechnical analysis for 3 potential sites
- Filed application with DECO for interconnection at 3 distribution sites

Capabilities

What regions of Michigan have the highest level of wind energy harvest potential?

The thumb …. The thumb… The thumb!!!

And why do you believe that?

- Good, contiguous wind resource
- Two projects are completed in the thumb that represent 90%+ of Michigan "in service" wind capacity
- Over 80,000 acres under lease or easement for wind development
- Numerous met towers are in place
- Several preconstruction activities occurring
- Engaged governmental officials, businesses, landowners and residents

Detroit Edison has a natural bias to develop in our service territory

Capabilities

What is the estimated maximum and minimum wind generating capacity in MWs that can be installed in the regions you are identifying?

Minimum of 500MW and a Maximum of 2,800 MW

And why do you believe that?

- Minimum capability represents an approximation of what is in service and what can be constructed on existing wires (transmission or distribution) with minimal upgrades
- Maximum capacity assumes new transmission will be constructed in the thumb considering setbacks ...

Huron County Maximum

Incremental Reductions

837 sq mi in Huron Co
-90 sq mi of shoreline (1 mile setback – visual & wildlife)
747
-36 sq mi of cities (with 1 mile buffer)
711
-213 sq mi of roads (410' setback)
498
-130 sq mi of homes & structures (1,000' setback less 40% overlap with roads)
368
-74 sq mi of woods/streams/wetlands (estimate)
294
-20 sq mi of FAA restricted land (estimate)
274 sq mi max available land

1 sq mi = 640 acres 125 acres = 1 turbine 1 turbine = 2MW

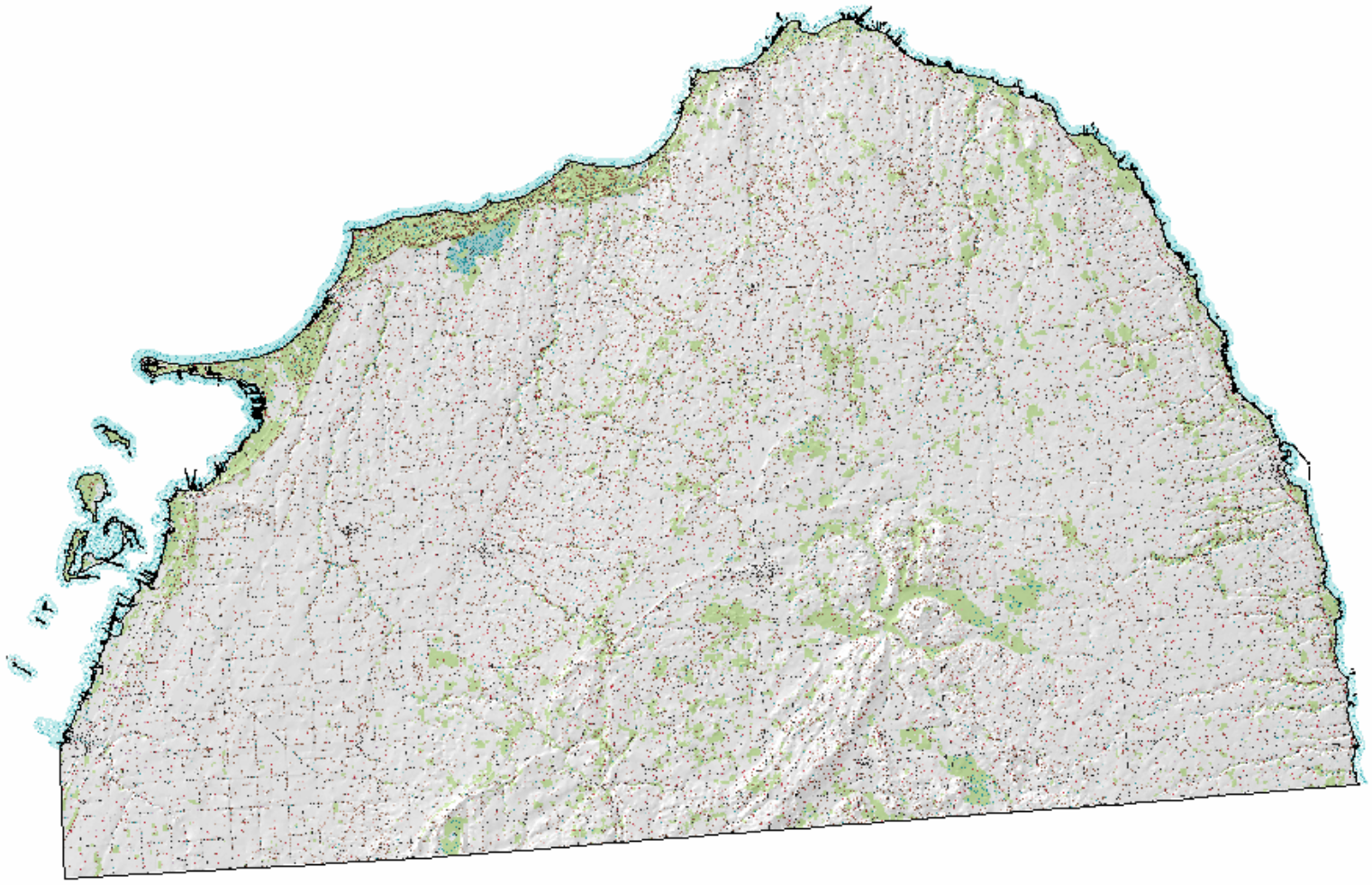
274sq mi * (640 acres/125 acres/turbine) * 2MW/turbine = 2800 MW

Considering that rail & transmission line setbacks, communication beam paths as well as marginal wind & NIMBY were not deducted from the max buildable area, a probable maximum of **1,400 MW** appears to be reasonable for Huron County. If Tuscola and Sanilac counties have 50% of the wind regime and similar setbacks to Huron Co, a total maximum for the thumb area of the state would be approximately **2,800MW.**

Huron County Setbacks

DTE Energy

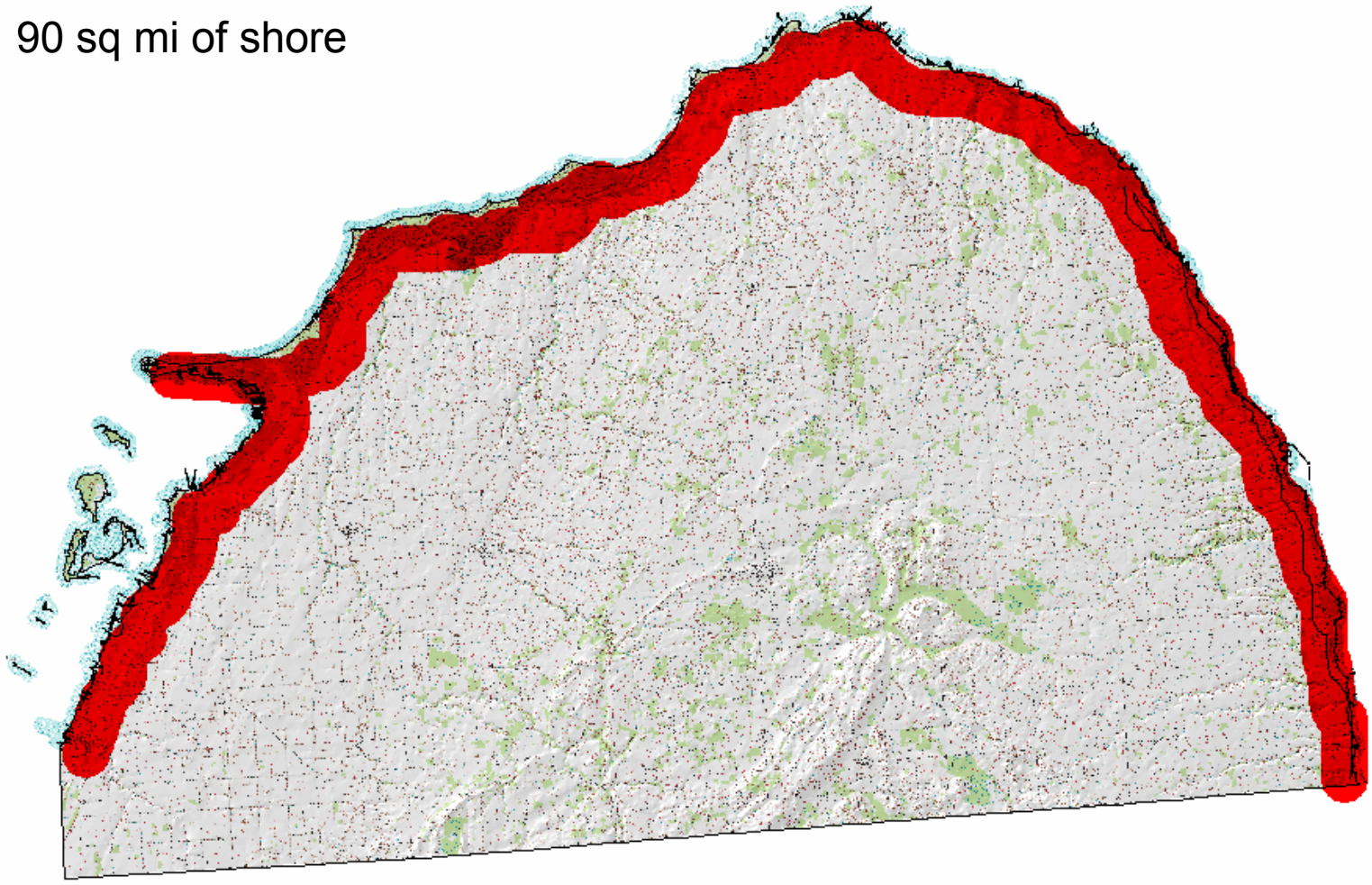
Huron County – 837 Square Miles



Huron County Setbacks

Huron County – 837 Square Miles

90 sq mi of shore

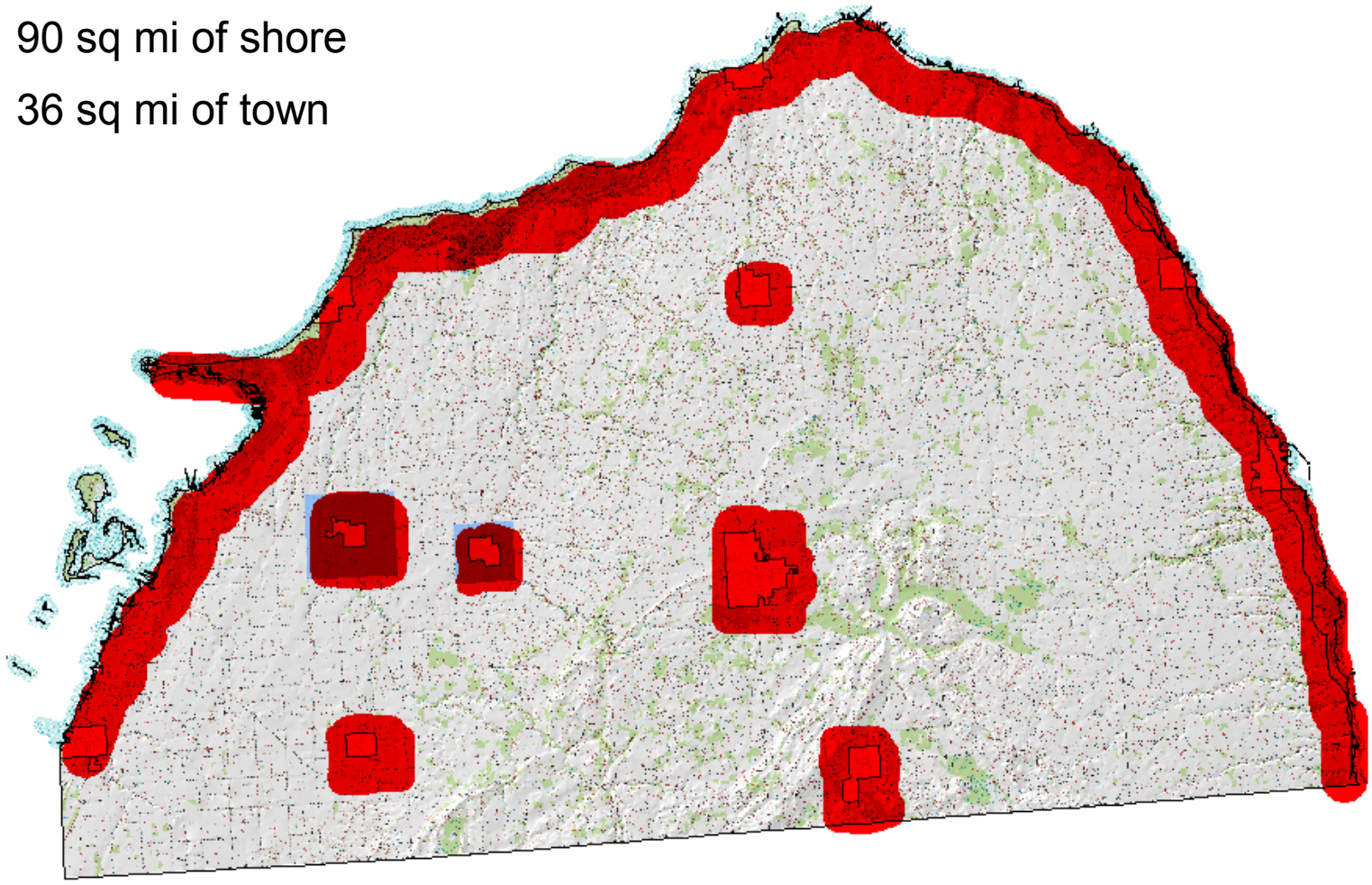


Huron County Setbacks

Huron County – 837 Square Miles

90 sq mi of shore

36 sq mi of town



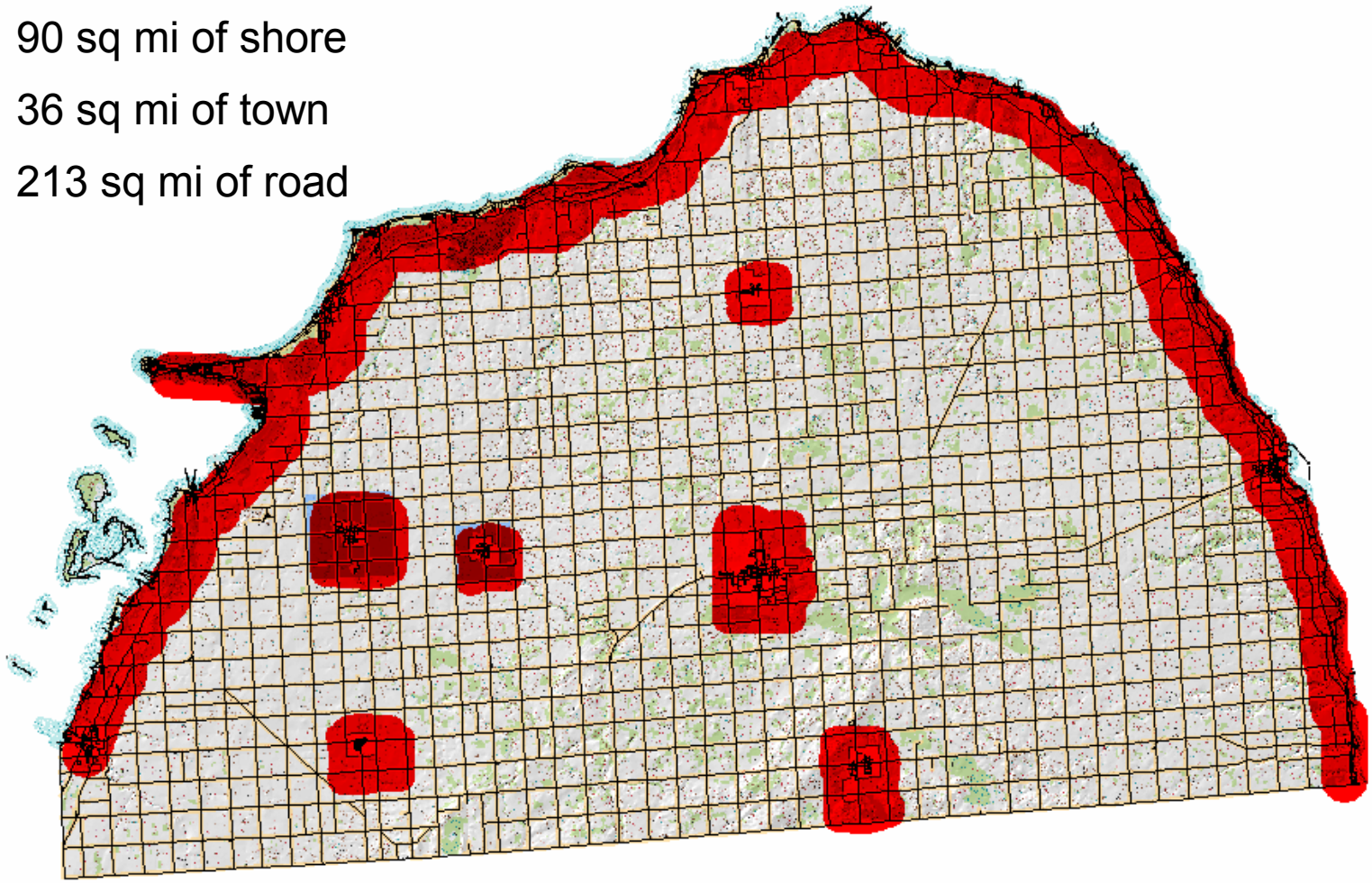
Huron County Setbacks

Huron County – 837 Square Miles

90 sq mi of shore

36 sq mi of town

213 sq mi of road



Huron County Setbacks

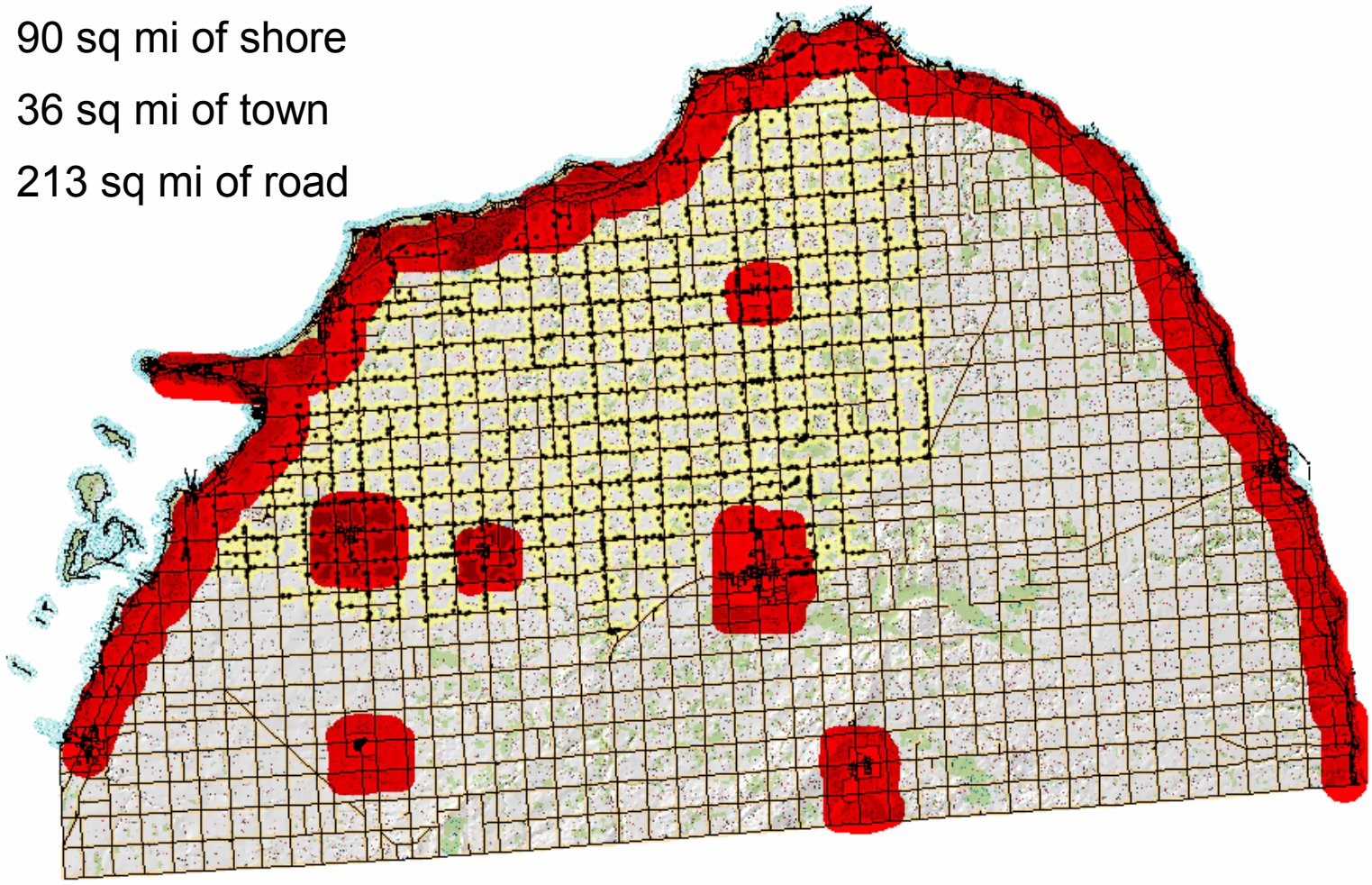
Huron County – 837 Square Miles

90 sq mi of shore

36 sq mi of town

213 sq mi of road

130 sq mi of house



Huron County Setbacks

Huron County – 837 Square Miles

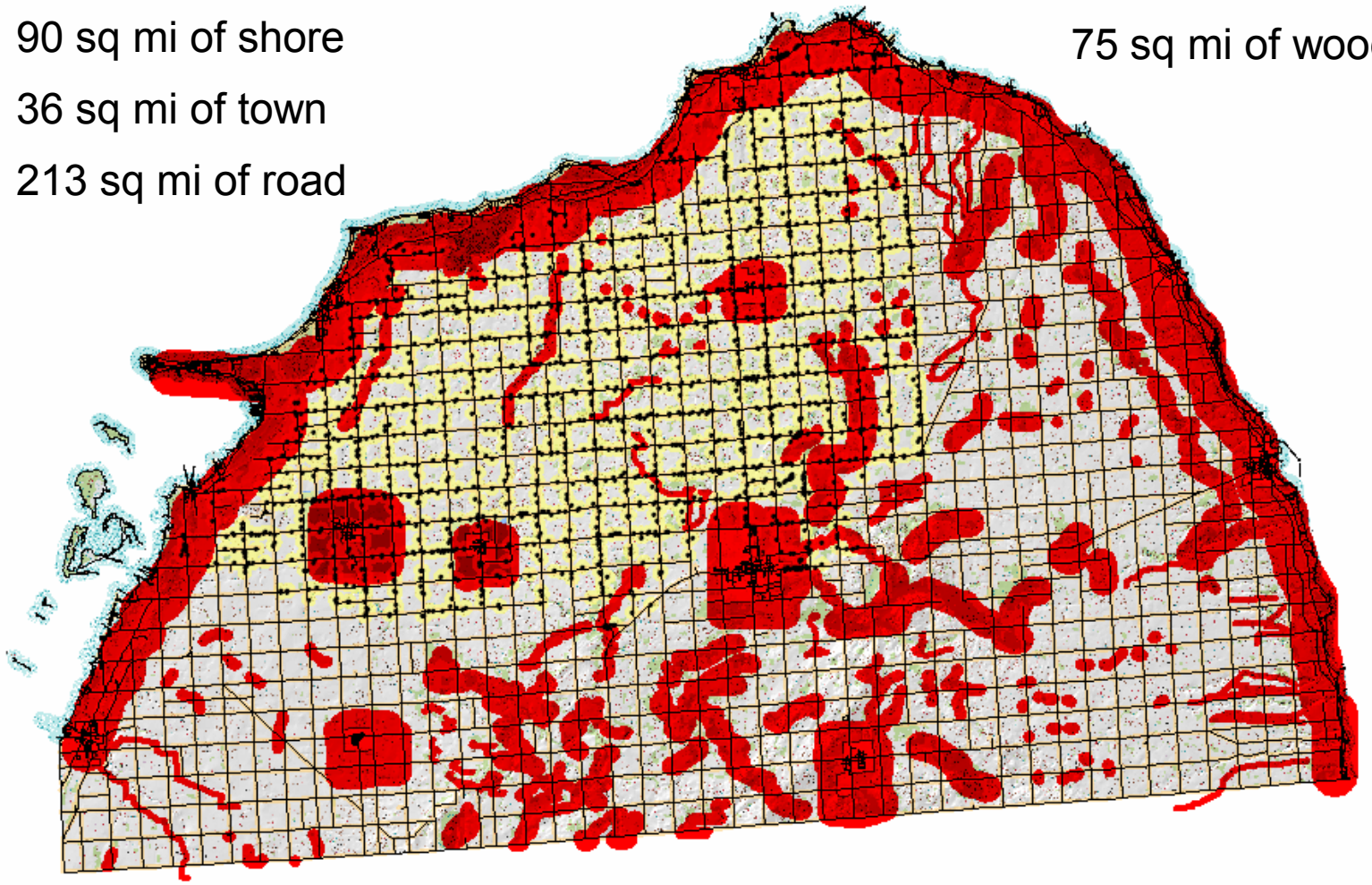
90 sq mi of shore

36 sq mi of town

213 sq mi of road

130 sq mi of house

75 sq mi of woods & wetlands



Huron County Setbacks

Huron County – 837 Square Miles

90 sq mi of shore

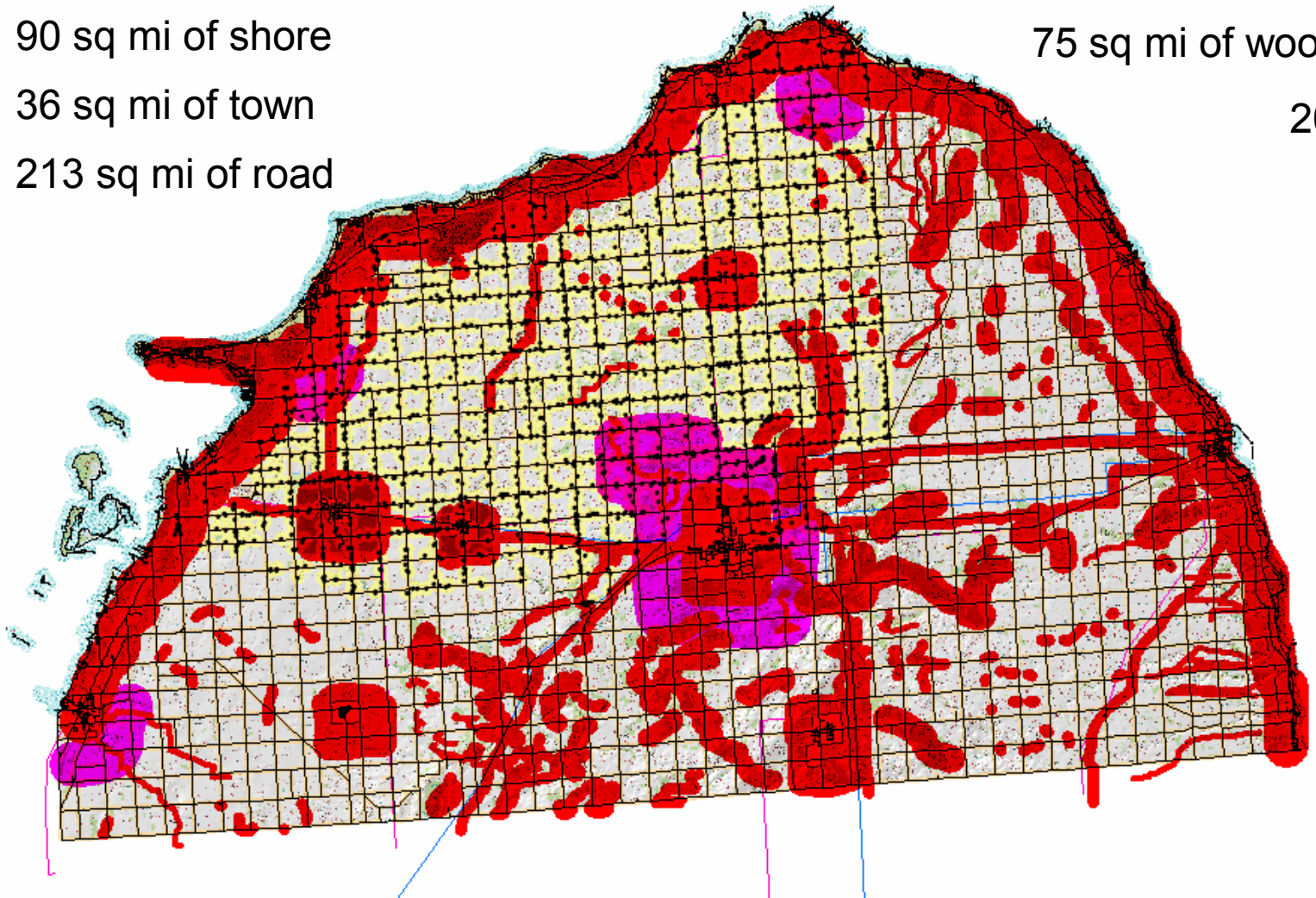
36 sq mi of town

213 sq mi of road

130 sq mi of house

75 sq mi of woods & wetlands

20 sq mi of FAA



Huron County Setbacks Micro View

The developable portion of one square mile of farmland is significantly reduced by offsets for roads and houses

Capabilities

What is the estimate of the annual maximum and minimum energy production potential for each identified region?

Minimum: 1,300 GWH

Maximum: 7,000 GWH

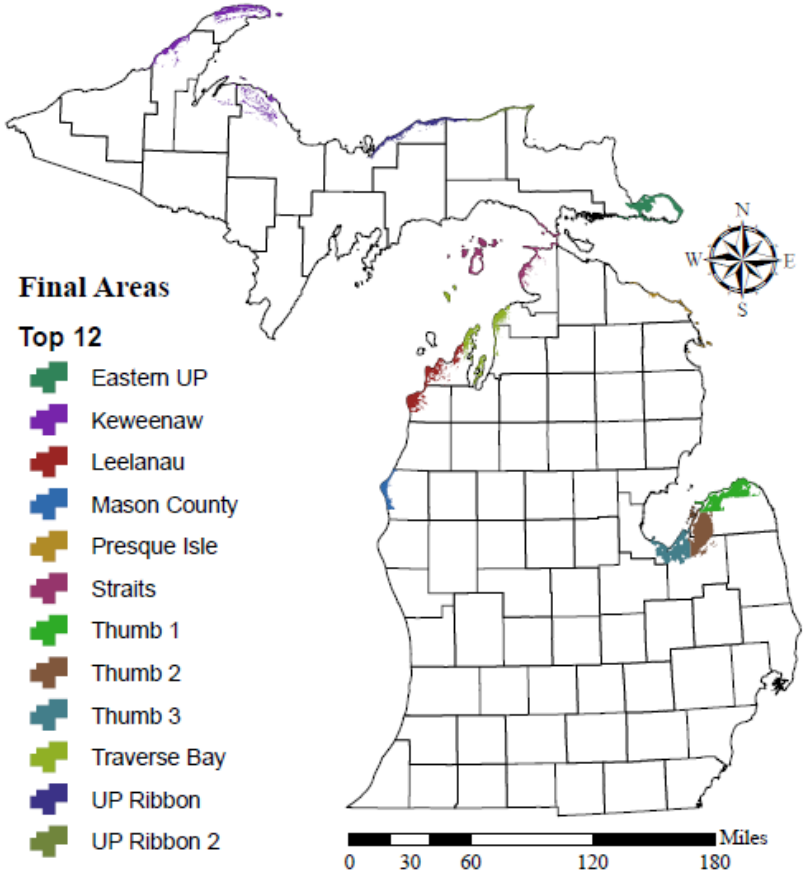
And why do you believe that?

30% capacity factor & 95% availability applied to the capacity estimates.

What is your estimate of the maximum wind generation capacity already in service in the regions you are identifying

122 MW

Summary



Source: MSU Land Policy Institute

- We concur with MSU Land Policy Institute's findings that the thumb area of the state has the highest potential for large scale wind development
- The scale of current development activities is significantly outpacing existing transmission infrastructure
- Timing of transmission expansion is of the essence to provide compliance with the Renewable Portfolio Standard

Questions